ABSTRACT

Mathematical models have been central to the study of epidemics, including malaria. Basically, the study of the research is to develop a mathematical model which can predict the ultimate survival probability of Plasmodium Falciparum mutant and its population spread.

To date, a number of models have been developed, including mathematical models related to the transmission rate and its spread, based on the assumption of malaria parasite characteristics in vector and hospes. All those models do not develop a procedure for detecting or computing the ultimate survival probability and the transmission rate of parasite to the population. Therefore, further developments are still required to guide malaria models closer to reality in the real world.

In this dissertation, the research is focused on the mathematical models in quantitative parasitology, based on Galton-Watson branching proses and maximum likelihood estimation. These models, which have been successfully constructed, can be used to predict the transmission rate, successful transmission, mean of clone per hospes, the ultimate survival probability and population spread.

Key words : mathematical models, the ultimate survival probability.